COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF TELECOMMUNICATIONS AND ENERGY

RESPONSE OF BAY STATE GAS COMPANY TO THE
FIRST SET OF INFORMATION REQUESTS FROM D.T.E.
D.T.E. 02-75

Date: April 2, 2003

Witness Responsible: William Gresham

DTE 1-20: Please refer to the econometric models "Residential General Use per Meter" (see Schedule BSG-III-2 of the Company's filing):

(a) explain the rationale for including the variable "EDD" in the models;
(b) explain the rationale for including the variable "trend" in the models;
(c) discuss the reason for keeping the variable "trend" as the explanatory variable in Brockton and Springfield models when the t-statistics are extremely low, showing very low statistical significance;
(d) discuss why the coefficients of determination "R^2 " for the residential "General Use per Meter" models are much lower than those for the rest of the econometric models presented by the Company;
(e) what other variables and/or model specification did the Company try to explain and forecast the "Residential General Use per Meter"? Explain why the Company did not keep those variable and/or model specification and why it kept the variables (weather and trend) and model specification presented instead.

RESPONSE: a) General use meters are those associated with customers whose dwellings are not heated with gas. However, these customers' loads may show some sensitivity to temperature. For example, a water heater may use more gas in the winter because of increased demand for hot water, or because the ambient temperature is lower. EDD is used to capture these effects.

b) There are at least two end-use factors affecting the consumption of residential general use customers. The efficiency of new appliances reduces consumption per customer as the stock of appliances is updated and the adoption of new end-use appliances increases consumption per customer. These competing factors can play out differently in different markets. The trend variable is designed to pick up the net effect. Leaving in the trend variable with low statistical significance is a technique to acknowledge the realities of the market, but not significantly change the forecast. If the sign of the trend variable were not rational, the variable would be eliminated.

c) See b.
d) Regression models explain variations in data. The primary source of variation for the residential heat customer use per meter is weather. This variation is explained by the EDD variable. General use customers, also known as non-heat customers, often have some weather-related consumption. Just as in the heat customer use per meter model, the weather-related consumption effect is captured in the model by the EDD variable. The EDD relationship, however, is so much weaker for the general use customers, that the model does not explain as much of the variation.
e) The Company has in the past tried various explanatory variables in residential general use per meter models. These variables include economic and demographic variables such as own and substitute prices, household size, energy efficiency indexes, income etc. In the previous long-range forecast filing (see DTE 98-86 Schedule BSG-III-2) the Company used a slightly different specification for residential general use per meter. In that filing the specification was a log form. However, the explanatory variables were similar in that EDDs and a trend with seasonal component were used. It has been the Company's experience that none of these alternative variables improves the models over simple EDD and trend variables. Moreover, the residential general class comprises only 1% of Bay State's throughput. A different model specification for this class would have virtually no impact on the resource plan.